

HIRALAL MAZUMDAR MEMORIAL COLLEGE FOR WOMEN

DEPARTMENT OF FOOD AND NUTRITION

B.SC HONOURS 2ND SEMISTER

MODEL QUESTION PAPER

FNTACOR03T FOOD CHEMISTRY

1. Protein & Amino acids

Long questions (FM-5/6)

1. Write down the definition of protein? Classify it.(with definition and example)
2. Write down the function of protein in our body?
3. RDA of protein.
4. What is denaturation of protein?
5. Discuss the structure of protein. Give example.
6. Write down the chemical and physical property of protein.
7. What is amino acid? Classify it.(with definition and example)
8. Write down the chemical and physical property of amino acid.
9. Short note: Biological value of protein (BV); Net protein utilization (NPU); Protein Efficiency ratio (PER);
Isoelectric point; Zwitter ion; Peptide Bond.
10. Color test of protein: Xanthoproteic reaction; Millons reaction; Hopkins cole reaction; Ninhydrin reaction; Biuret reaction
11. Function of amino acid.

Short questions (FM-1/2/3)

1. Full form: BV, NPU, PER
2. What is essential amino acid and non-essential amino acid ?Give an example.
3. Give an example of denaturation of protein.
4. What is simple protein and conjugated protein? Give example.
5. Give example of globular protein and fibrous protein.
6. Hydration of protein.
7. Give example of Plant and Animal protein.
8. Identify the types of protein-globulin, albumin, histones, glutelins, nucleoprotein, phosphoprotein, glycoprotein, chromo proteins.
9. Hyper and hypo effect of protein.

2. CARBOHYDRATE CHEMISTRY

Long question (FM-5/6)

1. Definition of carbohydrate. Classify it. (With definition and example)
2. Function of carbohydrate.
3. Hyper and Hypo effect of carbohydrate.
4. Short note on optical isomerism and stereoisomerism.
5. Autorotation of glucose and fructose.
6. Explain Glucose and Fructose give same ozone reaction.
7. What is dietary fiber? Write down the types of dietary fiber.
8. RDA of dietary fiber?
9. Function of dietary fiber.
10. What is lignin, cellulose, hemicelluloses, and pectin? Give example.
11. Physical and Chemical properties of mono, di and polysaccharides.

Short question :(1/2/3)

1. D-L stereoisomerism
2. Molisch test, Seliwanoff test, Tollens test
3. Osazone formation of glucose.
4. Benedict's test and Fehling's test
5. Reducing sugar and non-reducing sugar. Example
6. Conversion-D-Glucose to D-Fructose
7. Give example of mono, di, and poly saccharide.
6. Structure of D & L Glucose and Fructose
7. What is Asymmetric C?
8. Write down the name and structure of Aldose and Kitose sugar.
9. Kiliani Fischer Reaction.
10. Ruff Degradation
11. Which sugar found in milk?
12. Sucrose contains?
13. Is the monosaccharide a D sugar or L sugar.
14. General formula of carbohydrate.

3. LIPID CHEMISTRY

SHORT QUESTIONS: (1 OR 2 MARKS)

1. What is the difference between fats and oils?
2. What is PUFA?
3. What is MUFA?
4. Give the structure of Linoleic acid.

5. Write the name of one W-3 fatty acid.
6. What is phospholipid?
7. What is glycolipid?
8. Define sterols & steroids.
9. Define Eicosanoid with example.
10. What is cholesterol?
11. What is liposome?
12. Write about Essential fatty acids.
13. What is the relation between Trans fatty acids and cardiovascular disease?
14. Role of fats in the diet.

SHORT NOTES: (5 MARKS)

1. Esterification of fatty acids.
2. Melting point of fat is a great concern for food industry – explain.
3. Emulsification.
4. Hydrogenation - good or bad – explains.
5. Rancidity of fats.
6. Saponification number.
7. Iodine number.
8. Acid number.

4.WATER

1. Definition of Water in Food.(2)
2. What is Water Activity?(3)
3. Describe the Phase transition of food containing water.(5/6)

4. How does water activity influence on quality and stability of food?(4/5)

5. Write down the methods of stabilization of food systems by control of water activity?(5/6)

5. PHYSIOCHEMICAL PRINCIPLES

1. Define diffusion with examples
2. Physiological importance of diffusion.
3. Write short notes on semi permeable membrane.
4. Define osmotic pressure.
5. What instrument is used to maintain osmotic pressure?
6. Define isotonic hypotonic hypertonic solution with examples.
7. Short notes on reverse osmosis.
8. Distinguish between osmosis and diffusion
9. Define adsorption and absorption with examples
10. Distinguish between adsorption and absorption.
11. Applications of adsorption
12. What are true solution, suspension, colloidal system with suitable examples and diagrams
13. What are dispersed phase and dispersion medium . ?write with examples.
14. Write examples of some types of colloidal system in chart form.
15. What are lyophilic and lyophobic sols?
16. Distinguish between lyophilic and lyophobic sol.
17. Write short notes on _ tyndall effect, Brownian movement, emulsions, gels,
18. Write application of colloids.
19. What is viscosity? Write its units, write its biological applications
20. What is surface tension? Write its units. Application of surface tension.
21. What is acid, base, free acidity, hydrogen ion concentration, pH, buffers with examples
22. Define thermodynamics 1st law , 2nd law, entropy, enthalpy, gibbs free energy with equation.
23. Short notes on Oxidation reduction potential of bioactives (e.g. flavonoids, phenolic acids, quinols) and their applications in food systems.

6. ENZYMES

SHORT QUESTIONS: (1 OR 2 MARKS)

1. What is enzyme?
2. What is Apo enzyme?
3. What is coenzyme?
4. What is 'Ec No.'?
5. Define with example: Oxidoreductase / Transferase / Hydrolases / Lyases / Isomerases / Ligases.
6. What is 'active site of enzyme'?
7. Define 'Km'.
8. What is enzyme inhibition?
9. What is isozyme?
10. Define 'rate limiting enzyme'.
11. What is 'ribozyme'?
12. What is abzyme?
13. What is 'pro-enzyme'?

SHORT NOTES: (5 MARKS)

1. Classification of enzymes.
2. $E + S \rightleftharpoons ES \rightleftharpoons E + P$ – explain.
3. Lock and key model.
4. Koshland's induced fit model.
5. Linear transformation of Michaelis–Menten equation.

LONG QUESTIONS: (10 MARKS)

1. Michaelis–Menten kinetics of Enzymes – explain the process.
2. Enzyme inhibition – explain with classifications.

3. Factors regulating enzyme activities.

HUMAN PHYSIOLOGY

CC4

1. PHYSIOLOGY OF EXCITABLE CELLS

1. Name different types muscles. Write their functions.
2. Describe the microscopical structures of Skeletal / Cardiac / Smooth Muscle with their diagrams.
3. Describe the mechanism of skeletal muscle contraction and relaxation.
4. How the cross bridges are formed during muscle contraction?
5. Describe the chemical changes during muscle contraction.
6. Write down the differences between isotonic and isometric muscle contraction.
7. Describe the nerve impulse conduction through medullated and nonmedullated nerve fibres.
8. Describe the microscopical structure of synapse with diagram.
9. Describe the mechanism of synaptic transmission.
10. Describe the microscopical structure of neuromuscular junction with diagram.
11. Describe the mechanism of nerve impulse transmission through neuromuscular junction.
12. What are neurotransmitters? Give the examples of excitatory and inhibitory neurotransmitters.
13. What are neurotrophins. Give examples.
14. Write down the functions of neurotrophins in brief.
15. Describe briefly the structures of medullated and nonmedullated nerves.

CHAPTER 3:REPRODUCTIVE SYSTEM

Short question (1/2)

1. What is ovary?
2. What is testis?
3. What is oogenesis and ovulation?
4. What do you mean by menstrual cycle?
5. What do you mean by menopause?
6. What is fertilization?
7. What is implantation?
8. What is morula and blastula?
9. What is placenta?
10. What is testis?
11. What is spermatogenesis?
12. Definition of parturition and lactation?
13. What is reproductive system?
14. Write down the name of male and female reproductive organs?

Short note (5)

Fallopian tubule, uterus, function of placenta, oogenesis, spermatogenesis, fertilization, lactation, parturition, prostate gland, seminal vesicle, implantation of blastocysts

Long question (8/10)

1. Write down the structure of ovary?
2. Write down the structure of testis.
3. Changes during menstrual cycle?
4. Hormonal regulation of menstrual cycle and menopause.

5. Hormonal control of pregnancy ,parturition,lactation.
6. Hormonal regulation of spermatogenesis?
7. Write the name of overian hormone and testicular hormone ann their function.

chapter-4 endocrine system

Short question (1/2/3)

1. What is the main function of endocrine gland?
2. What is islets cell?
3. Insulin secreted by which organ?
4. Which hormone is secreted from neurohypothysis?
5. What causes most thyroid disease?
6. Where is the prolactine hormone produced?
7. An enlarged pituitary gland caused for?
8. Which gland regulates the thyroid gland?
9. What is the function of suline?
10. What is the function of glucagon?
11. Full form of ADH, TSH, PTH, ACTH, FSH, GNRH, LH, STH, LTH, MSH.
12. What is sertoli cell?
13. What is t4, t3, thyrocalcitonin?
14. Which gland control calcium level in the blood?

Short note (4/5/6)

growth hormone, ACTH, PTH, TSH, ADH, insulin, glucagon, pituitary gland, thyroid gland, adrenal cortex, estrogen, progesterone, androgen, oxytocin, certoli cell, hypothalamus, structure of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, growth factor.

Long questions (6/10)

1. Characteristics of endocrine gland.
2. Structure and function of thyroid gland.
3. Hypothyroidism, hyperthyroidism, goiter.
4. Function of parathyroid hormone.
5. Function and structure of pituitary gland.
6. Function of insulin, glucagon, somatostatin.
7. Structure and function of adrenal cortex.
8. Function of gastrointestinal hormones.

FNTSSEC01M: INSTRUMENTATION

Write short notes on the following topics (maximum 10 marks)

1. **Microscopy** : Brightfield and darkfield microscopy, Optical Microscopy, Phase contrast Microscopy, Inverted Microscopy
2. **Chromatography** Principles and applications of paper chromatography (including Descending and 2-D), Thin layer chromatography, HPLC. Separation of mixtures by paper / thin layer chromatography
3. **Spectrophotometry** Principle and use of study of absorption spectra of biomolecules, Analysis of biomolecules using UV and visible range, Colorimetry. Protein concentration of spectrophotometer/ colorimeter.
4. **Electrophoresis** Principle and applications of native polyacrylamide gel electrophoresis
5. **Centrifugation** Preparative and analytical centrifugation, density gradient centrifugation and ultracentrifugation Separation of components of a given mixture using a laboratory scale centrifuge
6. **ECG** Principles of ECG and EEG, application of ECG and EEG
7. **ELISA** Principle and applications of ELISA test

